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☑ 1. Document ID: US 20020191203 A1

L1: Entry 1 of 26 File: PGPB Dec 19, 2002

DOCUMENT-IDENTIFIER: US 20020191203 A1
TITLE: Halftone screening method and storage medium

Summary of Invention Paragraph (6):
[0005] FIGS. 1A and 1B are diagrams for explaining a conventional scattered dot dither type halftone cell. In FIGS. 1A and 1B, a non-regular hexagonal halftone cell is created by cutting a pair of confronting corners of a square halftone cell into a pair of confronting sloping sides. Since the pair of confronting corners of the square halftone cell made up of 9.times.9=81 pixels are cut into the pair of confronting sloping sides, the non-regular hexagonal halftone cell is made up of 81-9=72 pixels. FIG. 1A shows a non-regular hexagonal halftone cell C for one color, namely, cyan, and shows a case where 3.times.3=9 pixels at the central portion are colored to represent a dot C1 having a gradation level "9" with respect to a maximum number "72" of gradation levels.

Summary of Invention Paragraph (7):
[0006] When centers of halftone dots of each of the colors are arranged at the same pixel position of the halftone screen in a color printer, even a slight error in the positions of the halftone dots of each of the colors on the halftone screen results in a conspicuous change in color tone. FIG. 1B shows a case where a non-regular-hexagonal halftone cell M for magenta is shifted by 1 pixel to the right and 1 pixel to the top with respect to the non-regular hexagonal halftone cell C for cyan, and a non-regular hexagonal halftone cell Y for yellow is shifted by 2 pixels to the right and 1 pixel to the bottom with respect to the non-regular hexagonal halftone cell C for cyan. In this case, even if the 3.times.3=9 pixels at the central portion of the non-regular hexagonal halftone cell M is colored to represent a dot M1, the 3.times.3=9 pixels at the central portion of the non-regular hexagonal halftone cell Y is colored to represent a dot Y1, and the dots C1, M1 and Y1 are overlapped, the positions of the dots C1, M1 and Y1 do not match and the change in the color tone is conspicuous.

Brief Description of Drawings Paragraph (5):
[0019] FIG. 4 is a diagram showing reference non-regular hexagonal cells used in a second embodiment of the halftone screening method according to the present invention;

Detail Description Paragraph (13):
[0037] Next, a description will be given of a second embodiment of the halftone screening method according to the present invention, by referring to FIGS. 4 through 6. FIG. 4 is a diagram showing reference non-regular hexagonal cells used in the second embodiment of the halftone screening method. FIGS. 5A and 5B are diagrams for explaining screen angles in the second embodiment of the halftone screening method. Further, FIG. 6 is a diagram for explaining center dots of black, cyan and magenta screens in the second embodiment of the halftone screening method.

Detail Description Paragraph (15):
[0039] On the other hand, the second embodiment of the halftone screening method uses non-regular hexagonal halftone cells, similar to the first embodiment of the halftone screening method. The non-regular hexagonal halftone cell is created by cutting a pair of confronting corners of a square halftone cell into a pair of confronting sloping sides. Accordingly, the centers of the non-regular hexagonal

halftone cells are arranged in a 45-degree direction (or -45-degree direction), along the sloping sides of the non-regular hexagonal halftone cells, as shown in FIG. 4. The black screen (or the magenta screen) is regarded as the reference color screen, and the screens of other colors are rotated by an angle (or turned) and positioned with respect to the reference color screen, as shown in FIGS. 5A and 5B. FIG. 5A shows the cyan screen which is rotated relative to the reference black screen, and FIG. 5B shows the magenta screen which is further rotated with respect to the cyan screen relative to the reference black screen. When rotating the color screen, two mutually adjacent color dots which are adjacent to a color dot which becomes the center of rotation of the color screen are selected, and the other color screens are rotated so that the color dots of each of the other color screens becomes arranged between the two mutually adjacent color dots.

CLAIMS:

3. The halftone screening method as claimed in claim 2, wherein each of the cells has a non-regular hexagonal shape with two mutually confronting right-angled corners, and centers of the cells of the screens of two certain colors are respectively arranged at the two mutually confronting right-angled corners of the cell of the screen of the reference color.

4. The halftone screening method as claimed in claim 2, wherein each of the cells has a non-regular hexagonal shape, and a center of the cell of a black screen is arranged at a position where a cyan dot in the cell of a cyan screen, a magenta dot in the cell of the magenta screen and a yellow dot in the cell of the yellow screen overlap as tones of the cyan dot, the magenta dot and the yellow dot are increased and respectively indicate the same tone.

8. The halftone screening method as claimed in claim 7, wherein each of the cells has a non-regular hexagonal shape with two mutually confronting right-angled corners.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 2. Document ID: US 20020159094 A1

L1: Entry 2 of 26 File: PGPB Oct 31, 2002

DOCUMENT-IDENTIFIER: US 20020159094 A1
TITLE: Digital halftoning

Detail Description Paragraph (48):
[0086] Referring to FIG. 5B, these visual artifacts may be mitigated by arranging the cells 502a-d in a hexagonal pattern, producing halftone pixels 512a-d containing dots 514a-d, respectively. Use of the hexagonal pattern produces less pattern visibility and bridging than the rectangular pattern shown in FIG. 5A.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 3. Document ID: US 20020089708 A1

L1: Entry 3 of 26 File: PGPB Jul 11, 2002

DOCUMENT-IDENTIFIER: US 20020089708 A1

TITLE: Halftoning using dot and line screens to avoid two and three color moire

Detail Description Paragraph (12):
[0051] Therefore, Eqs. (4a)-(4d) express the frequency-to-spatial-componen- t relationship for a cell defined by the spatial vectors V.sub.1 and V.sub.2. The frequency components, f.sub.x1, f.sub.y1, f.sub.x2, and f.sub.y2, are rational numbers completely defined by the four integer coordinate values, x.sub.1, y.sub.1, x.sub.2 and y.sub.2. Since Eqs. (4a)-(4d) describe a corresponding "mapping" of the frequency components to the spatial components, it should be appreciated that any analysis of the moir-free conditions in the frequency domain can be easily translated into a spatial domain specification. It should be appreciated that, while the above equations are developed in relation to a non-orthogonal single-cell halftone dot having a parallelogram-like shape, it is apparent that the above equations may suitably describe other non-parallelogram shaped dots, for example, squares, rectangles, triangles, ellipses, hexagons, etc.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 4. Document ID: US 6362845 B1

L1: Entry 4 of 26 File: USPT Mar 26, 2002

DOCUMENT-IDENTIFIER: US 6362845 B1
TITLE: Method and apparatus for electrostatographic printing utilizing an electrode array and a charge retentive imaging member

Detailed Description Text (14):
Turning now to the construction of the electroreceptor belt 10, embedded in the image recording surface 12 is a dense array of electrically conductive segments 104. Each of the conductive segments 104 is a discrete portion of conductive material having a shallow depth and an exposed, outwardly facing surface. The conductive segments 104 may be densely arranged in either a random pattern, or, preferably, in a regular pattern similar to that of, for example, a hexagonal packed array, or a rotated halftone screen. Preferably, the spacing of the conductive segments 104 generally corresponds to the spacing of the recording electrode tips 106. Increasing the density of both the recording electrode tips 106 and the conductive segments 104 will increase the resolution of the latent image to be recorded in the recording medium.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 5. Document ID: US 5957593 A

L1: Entry 5 of 26 File: USPT Sep 28, 1999

DOCUMENT-IDENTIFIER: US 5957593 A
TITLE: Halftone pattern geometry for printing high quality images

Brief Summary Text (24):
In a preferred embodiment, the pixels in a single-pixel wide linear halftone cell grow in one direction. The fill order (i.e., darkening sequence of the pixels in the cell) is of importance to the extent that the printed spot appears connected (i.e., has no gaps) at every tint or gray scale level. The cells are clustered in a super-cell structure that provides a dispersed-dot ordered dither for a regular

hexagonal grid containing nine elements. The super-cell structure is configured in the asymmetric hexagonal grid to provide perceptibly uniform darkening from asymmetric halftone cells. The "visitation order" of darkening selected pixels in a specified sequence of linear cells in the super-cell structure provides a nested dot growth pattern dither process. A preferred visitation order results in each cell being within one gray scale level of every other cell in the super-cell structure.

Drawing Description Text (9):
FIG. 8 shows a hexagonal super-cell structure of and a preferred spot growth visitation order for an array of nine halftone cells of the type shown in FIG. 6.

Detailed Description Text (14):
To increase the number of perceivable gray scale levels, a group of cells 200 is assembled in a super-cell structure. FIG. 8 shows a hexagonal super-cell 210 comprised of nine halftone cells of the type shown in FIG. 7, seven of which have both of their terminal pixels left free to contact the terminal pixels of other super-cell structures 210 in a tessellation pattern and two of which have an end-to-end terminal pixel contacting relationship.

CLAIMS:

1. A method of creating a halftone pattern geometry using multiple halftone cells to synthesize a printer image with minimal low frequency artifacts, comprising:

developing halftone cells having initially darkened pixels at predetermined positions, each cell being a single pixel wide having multiple pixels arranged to form a spatially asymmetric spot growth area having a dominant length dimension;

arranging the halftone cells relative to one another in a group which approximates a hexagonal grid angularly displaced from the horizontal so that the initially darkened pixels of the halftone cells in the group form a diffuse pattern, the diffuse pattern minimizing the development of low frequency artifacts providing a dispersed dot ordered dither that distributes row and column artifacts along 3 axes of symmetry to minimize perceived patterning; and

darkening the pixels of the halftone cells in the group in a sequence that disperses darkened pixels among different ones of the halftone cells as they are progressively darkened to achieve spot growth generally along the length dimension of each cell thereby to achieve a perceived monotonic darkening of the cell via a nested dot growth pattern that is spatially asymmetric.

☐ 6. Document ID: US 5884013 A

L1: Entry 6 of 26 File: USPT Mar 16, 1999

DOCUMENT-IDENTIFIER: US 5884013 A
**** See image for Certificate of Correction ****
TITLE: Autotypical screening with optimised dotshape

Detailed Description Text (98):
It may be remarked that hexagonal, rhomboidal and other forms of screen cells are described e.g. in "Digital halftoning", R. Ulichney, MIT-Press, Cambridge (U.S.A.)-London (G.B.), 1987; whereas the use of triangles in polygon rasterization is disclosed e.g. in WO 94/10647 (applicant S-MOS Systems Inc.).

☐ 7. Document ID: US 5841458 A

L1: Entry 7 of 26 File: USPT Nov 24, 1998

DOCUMENT-IDENTIFIER: US 5841458 A
TITLE: Halftoning method for multi-color laser printer

Drawing Description Text (4):
FIG. 3 shows a hexagonal super-cell structure of and a preferred spot growth visitation order for an array of nine halftone cells of the type shown in FIG. 1A that form a line screen in accordance with the present invention.

Detailed Description Text (8):
Halftoning has traditionally been achieved by a rectangular grid of cells. In the embodiment described below, the halftone pattern is a vertical line screen with cells grouped on hexagonal centers and aligned in an X-Y coordinate axis system. The pattern is aligned in X and Y to minimize interference patterns between the halftone and high frequency artifacts of the laser printing process. A hexagonal grid is preferable to a rectangular grid because the latter grid aligned in X and Y would produce conspicuous halftoning artifacts. The hexagonal grid avoids the horizontal components of such halftoning artifacts.

Detailed Description Text (9):
To increase the number of perceivable gray scale levels, a group of cells 200a is assembled in a super-cell structure. FIG. 3 shows a hexagonal super-cell 210 comprised of nine halftone cells of the type shown in FIG. 2A for the substractive primary color screen. The super-cell for the black screen is the same except that the spot fill order is the reverse of that indicated.

Detailed Description Text (12):
The embodiment uses a super-cell tile structure of the form ##STR1## in which the numbers indicate the darkening order sequence for the nine cells in the super-cell structure. The halftone pattern is a vertical line screen with cells grouped on hexagonal centers and aligned along X and Y coordinate axes. The dots are grouped in the linear direction of print medium motion. The grouping of the dots reduces the effect of halftone screen misregistration, and the cell alignment along the X- and Y-axes results in fewer high frequency artifacts. The nine level super-cell pattern built on a 30 pixel-based cell provides 9.times.30+1=271 tint or gray scale levels for each color plane. Skilled persons will appreciate that a super-cell structure may include different numbers of cells and cells having different numbers of pixels from those described for super-cell structure 210.

CLAIMS:

5. The method of claim 1, further comprising arranging the halftone cells relative to one another in a group so that the first darkened pixels of the halftone cells in the group form a vertical line screen with the halftone cells grouped on hexagonal centers and aligned with an X-Y coordinate axis system, the vertical line screen reducing high frequency artifacts.

☐ 8. Document ID: US 5796929 A

L1: Entry 8 of 26 File: USPT Aug 18, 1998

DOCUMENT-IDENTIFIER: US 5796929 A
TITLE: Banding and ink-bleeding reduction in cluster dither by screen displacement

Detailed Description Text (16):
FIG. 6 depicts another dither-array relationship that could be used. In this arrangement, circles, squares, and triangles represent the respective components' cluster centers as before. The individual-component screens are of the type commonly referred to as hexagonal, the magenta dither array is displaced to the right by one-third of the horizontal cluster spacing from the cyan-array cluster centers, and the yellow cluster centers are displaced from the cyan cluster centers by two-thirds of that spacing.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 9. Document ID: US 5710636 A

L1: Entry 9 of 26 File: USPT Jan 20, 1998

DOCUMENT-IDENTIFIER: US 5710636 A
TITLE: Method and apparatus for generating halftone images having human readable patterns formed therein

Detailed Description Text (6):
Each of the halftone cells is composed of a two-dimensional array of pixels. For example, FIGS. 2A-2C illustrate halftone cells 20, 22 and 24 produced from dot patterns 26 forming different shapes according to the present invention. The halftone cells 20, 22 and 24 are generally square shaped but may be formed of different even sided, symmetric shapes such as hexagons. End portions of the dot patterns 26 within a halftone cell 20, 22 and 24 intersect at approximately a center portion of the sides of the halftone cell. The halftone cells 20, 22 and 24 shown in FIGS. 2A, 2B and 2C are shown rotated 90 degrees from one another. The rotation of the halftone cells 20, 22 and 24 may be used to encode data within each of the cells, as explained above. Each of the halftone cells 20, 22 and 24 is relatively small. For example, each of the halftone cells 20, 22 and 24 in actual use may have a size of approximately 1/75".times.1/75".

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☑ 10. Document ID: US 5706099 A

L1: Entry 10 of 26 File: USPT Jan 6, 1998

DOCUMENT-IDENTIFIER: US 5706099 A
TITLE: Method and apparatus for generating serpentine halftone images

Detailed Description Text (5):
Each of the halftone cells is composed of a two-dimensional array of pixels. For example, FIG. 2 illustrates halftone cells 20 produced according to the present invention. Each of the halftone cells 20 is formed from serpentine dot patterns forming two separate arcs 22. The halftone cells 20 are generally square shaped but may be formed of different, symmetric shapes such as hexagons. Each of the two arcs

22 within a halftone cell 20 intersect two adjacent sides of the halftone cell 20 at approximately a center portion of each. The halftone cells 20 shown in FIG. 2 are shown rotated 90 degrees from one another. The rotation of the halftone cells 20 is used to encode data within each of the cells, as will be further explained below. Each of the halftone cells 20 is relatively small. For example, each of the halftone cells 20 in actual use may have a size of approximately 1/75".times.1/75".

☑ 11. Document ID: US 5701366 A

L1: Entry 11 of 26 File: USPT Dec 23, 1997

DOCUMENT-IDENTIFIER: US 5701366 A
TITLE: Halftoning with gradient-based selection of dither matrices

Brief Summary Text (14):
The bi-level image in FIG. 6 shows the effect of using a supercell technique to decrease banding. This image was produced using the supercell dither matrix 16 in FIG. 8(b), which is based on the 30-cell hexagonal matrix 15 of FIG. 8(a), according to the conventional dithering technique well known to everybody skilled in the art. The area of this supercell dither tile is 90; this technique is therefore able to reproduce faithfully 91 distinct gray shades. The sample in FIG. 6 shows diminishing of the banding effect, with respect to the image in FIG. 5. However, distracting low frequency structures are clearly visible in the computer-generated business graphics parts 625 and 635 of the sample image.

Brief Summary Text (28):
Exemplary outputs of improved dithering according to the invention are presented in FIGS. 9 and 10, with FIG. 9 corresponding to reciprocally-compatible dither matrices of parallelogram shape (compare FIGS. 1 and 2), and with FIG. 10 corresponding to reciprocally compatible dither matrices of hexagonal shape (compare FIGS. 5 and 6).

Drawing Description Text (6):
FIGS. 9 and 10 are halftone images illustrating the effect of the present invention, with FIG. 9 showing the effect using rectangular dither matrix tiles and with FIG. 10 showing the effect when using hexagonal dither matrix tiles.

Detailed Description Text (27):
It should also be noted that hexagonal dither matrices 14, 15 and 16, illustrated in FIGS. 7(a), 8(a) and 8(b), respectively, are all mutually reciprocally compatible and are therefore good choices for dither matrix storage 140 in a case where gradient analyzer unit 120 identifies three different gradient classes. It is also possible to use only two of these three dither matrices in a case where gradient analyzer unit 120 identifies two different gradient classes. Indeed, as mentioned above, the representative halftone image of FIG. 10 was produced by using hexagonal dither tiles 14 and 50 in dither matrix store 140 in a case where gradient analyzer unit 120 identified two different gradient areas.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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☑ 12. Document ID: US 5588094 A

L1: Entry 12 of 26 File: USPT Dec 24, 1996

DOCUMENT-IDENTIFIER: US 5588094 A

TITLE: Post-processing bit-map decimation compensation method for printing high quality images

Brief Summary Text (23):
In a preferred embodiment, the pixels in a single-pixel wide linear halftone cell grow in one direction. The fill order (i.e., darkening sequence of the pixels in the cell) is of importance to the extent that the printed spot appears connected (i.e., has no gaps) at every tint or gray scale level. The cells are clustered in a super-cell structure that provides a dispersed-dot ordered dither for a regular hexagonal grid containing nine elements. The super-cell structure is configured in the asymmetric hexagonal grid to provide perceptibly uniform darkening from asymmetric halftone cells. The "visitation order" of darkening selected pixels in a specified sequence of linear cells in the super-cell structure provides a nested dot growth pattern dither process. A preferred visitation order results in each cell being within one gray scale level of every other cell in the super-cell structure.

Drawing Description Text (9):
FIG. 8 shows a hexagonal super-cell structure of and a preferred spot growth visitation order for an array of nine halftone cells of the type shown in FIG. 6.

Detailed Description Text (14):
To increase the number of perceivable gray scale levels, a group of cells 200 is assembled in a super-cell structure. FIG. 8 shows a hexagonal super-cell 210 comprised of nine halftone cells of the type shown in FIG. 7, seven of which have both of their terminal pixels left free to contact the terminal pixels of other super-cell structures 210 in a tessellation pattern and two of which have an end-to-end terminal pixel contacting relationship.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 13. Document ID: US 5369497 A

L1: Entry 13 of 26 File: USPT Nov 29, 1994

DOCUMENT-IDENTIFIER: US 5369497 A
TITLE: Apparatus and method for modulating the area of pixels for tone reproduction

Detailed Description Text (74):
It should be noted that, in the preferred embodiment, the pixel to pel configuration pattern mapping was a particular type of mapping. However, it should be noted, that the present invention is not limited to the use of the mapping of the preferred embodiment. In general, the present invention applies to embodiments wherein the pixel to pel configuration pattern mapping is a whole host of different mapping functions such as, for example and without limitation, area modulation imaging produced by clustered threshold arrays, dispersed dot ordered dither mapping, rectangular or hexagonal array structures, non-monotonic pel configuration patterns wherein pels that are used in a lower gray scale level do not have to be used in higher gray scale levels, and so forth.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 14. Document ID: US 5355303 A

L1: Entry 14 of 26 File: USPT Oct 11, 1994

DOCUMENT-IDENTIFIER: US 5355303 A
TITLE: Printing apparatus

Detailed Description Text (75):
It should be noted that, in the preferred embodiment, the pixel to pel configuration pattern mapping was a particular type of mapping. However, it should be noted, that the present invention is not limited to the use of the mapping of the preferred embodiment. In general, the present invention applies to embodiments wherein the pixel to pel configuration pattern mapping is a whole host of different mapping functions such as, for example and without limitation, area modulation imaging produced by clustered threshold arrays, dispersed dot ordered dither mapping, rectangular or hexagonal array structures, non-monotonic pel configuration patterns wherein pels that are used in a lower gray scale level do not have to be used in higher gray scale levels, and so forth.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 15. Document ID: US 5221971 A

L1: Entry 15 of 26 File: USPT Jun 22, 1993

DOCUMENT-IDENTIFIER: US 5221971 A
TITLE: Area modulation printing apparatus

Detailed Description Text (75):
It should be noted that, in the preferred embodiment, the pixel to pel configuration pattern mapping was a particular type of mapping. However, it should be noted, that the present invention is not limited to the use of the mapping of the preferred embodiment. In general, the present invention applies to embodiments wherein the pixel to pel configuration pattern mapping is a whole host of different mapping functions such as, for example and without limitation, area modulation imaging produced by clustered threshold arrays, dispersed dot ordered dither mapping, rectangular or hexagonal array structures, non-monotonic pel configuration patterns wherein pels that are used in a lower gray scale level do not have to be used in higher gray scale levels, and so forth.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 16. Document ID: US 5170261 A

L1: Entry 16 of 26 File: USPT Dec 8, 1992

DOCUMENT-IDENTIFIER: US 5170261 A
TITLE: Printing method

Detailed Description Text (75):
It should be noted that, in the preferred embodiment, the pixel to pel configuration pattern mapping was a particular type of mapping. However, it should be noted, that the present invention is not limited to the use of the mapping of the preferred embodiment. In general, the present invention applies to embodiments wherein the pixel to pel configuration pattern mapping is a whole host of different mapping functions such as, for example and without limitation, area modulation imaging produced by clustered threshold arrays, dispersed dot ordered dither mapping, rectangular or hexagonal array structures, non-monotonic pel configuration patterns

wherein pels that are used in a lower gray scale level do not have to be used in higher gray scale levels, and so forth.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 17. Document ID: US 4758893 A

L1: Entry 17 of 26 File: USPT Jul 19, 1988

DOCUMENT-IDENTIFIER: US 4758893 A
TITLE: Cinematic dithering for television systems

Detailed Description Text (14):
FIG. 6 exemplifies ordered-dither frame patterns for the one-cycle species, assuming 3-phase dithers based on sizes 0, 1 and 2 and the frame-to-frame cycle of sizes shown in FIG. 2A. The dither shown at A of FIG. 6 has the Frame 1 pattern defined by a 3.times.3 matrix, labelled 40, which becomes 140 of Frame 2 and 240 of Frame 3 so that the frames change likewise. The dither elements are preferably arranged in hexagonal array (corresponding to hexagonally arranged Nyquist samples), and matrices are skewed as shown to avoid concentrating like-sized elements along distinct parallel lines, like the elements found along the dotted lines of matrices 40' and 40", shown at D of FIG. 6. Matrix 40' is the same as 40 with the elements in rectangular array, while matrix 40" is like 40 but skewed in the opposite direction. As the sizes rotate from frame to frame, the indicated lines of these two matrices would progress uniformly across the scanning raster and might result in noticeable texture crawls across the TV screen.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 18. Document ID: JP 2001218053 A

L1: Entry 18 of 26 File: JPAB Aug 10, 2001

DOCUMENT-IDENTIFIER: JP 2001218053 A
TITLE: HALFTONE SCREENING METHOD AND INFORMATION RECORDING MEDIUM WITH COMPUTER PROGRAM PERFORMING THE METHOD RECORDED THEREON

Abstract Text (2):
SOLUTION: In the case of performing digital halftone screening that uses a hexagon cell 1 obtained by cutting off a pair of facing corners of a square cell on a square lattice and defining the as oblique sides as a halftone cell, one area 2 that does not come in contact with dots in an adjacent hexagon cell 1 is set in the hexagon cell 1, and the threshold for binarization of each dot position in the hexagon cell 1 is set so that one dot plotting start position 3 in the individual area 2 can be random in each hexagon cell 1.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 19. Document ID: JP 2001126059 A

L1: Entry 19 of 26 File: JPAB May 11, 2001

DOCUMENT-IDENTIFIER: JP 2001126059 A
TITLE: HALFTONE SCREENING METHOD

Abstract Text (2):
SOLUTION: A rectangular halftone dither tiles 1 having the same aspect ratio as the resolution ratio of the main scanning direction and the sub-scanning direction of a picture output device are prepared, and plural irregular hexagonal cells 2 prepared on a square lattice are arranged within the tiles 1. The cells 2 are deformed in a vertical direction and a horizontal direction in accordance with the aspect ratio of the tiles 1.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 20. Document ID: JP 2000196886 A

L1: Entry 20 of 26 File: JPAB Jul 14, 2000

DOCUMENT-IDENTIFIER: JP 2000196886 A
TITLE: SCREENING METHOD

Abstract Text (1):
PROBLEM TO BE SOLVED: To provide a screening method in which undulation of an image is suppressed when in a pair of facing opposite corners of a square cell on a square lattice are cut off to form a hexagonal cell which is not a regular hexagon, and plural hexagonal cells are combined to form one halftone cell.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 21. Document ID: JP 02281873 A

L1: Entry 21 of 26 File: JPAB Nov 19, 1990

DOCUMENT-IDENTIFIER: JP 02281873 A
TITLE: REPRESENTING METHOD FOR HALF TONE IMAGE

Abstract Text (2):
CONSTITUTION: As a whole, one piece of macro-dither cell MD consists of four pieces of dither cells D1-D4 surrounded by a full line frame, and the dither cells D1-D4 are patterns of eight picture elements of a roughly regular hexagonal shape. In such a way, the non-rectangular dither cell and the macro-dither cell formed by arranging adjacently plural dither cells through are defined, the density of a processing object image is evaluated by a macro-dither cell unit, and also, a threshold rank related to the dither cell in the macro-dither cell and a threshold rank of each picture element in the dither cell are defined. Accordingly, while increasing the number of gradations by the macro-dither cell, a dense dot expression can be executed in each local part. In such a way, a natural half tone expression having a high resolution can be executed.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 22. Document ID: EP 293214 A2

L1: Entry 22 of 26 File: EPAB Nov 30, 1988

DOCUMENT-IDENTIFIER: EP 293214 A2
TITLE: System for producing dithered images on asymmetric grids.

Abstract Text (1):
CHG DATE=19990617 STATUS=O> An image dithering system for producing dithered image values in response to continuous tone image values and in response to a rectangular dither matrix generated based on a dither matrix designed for a hexagonal grid. Such a rectangular dither matrix is more immune to asymmetrical grid patterns, whose aspect ratios differ from one, than are dither matrices based on other grid patterns, most notably for square or rectangular grid patterns.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 23. Document ID: JP 2002094787 A

L1: Entry 23 of 26 File: DWPI Mar 29, 2002

DERWENT-ACC-NO: 2003-169882
DERWENT-WEEK: 200317

TITLE: Halftone screening method in printer, involves arranging specific number of dots at prescribed portions surrounding centrally arranged dot with respect to hexagonal cell

Standard Title Terms (1):
HALFTONE SCREEN METHOD PRINT ARRANGE SPECIFIC NUMBER DOT PRESCRIBED PORTION SURROUND CENTRAL ARRANGE DOT RESPECT HEXAGON CELL

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

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☐ 24. Document ID: JP 2002024819 A

L1: Entry 24 of 26 File: DWPI Jan 25, 2002

DERWENT-ACC-NO: 2002-366670
DERWENT-WEEK: 200240

TITLE: Image processor has dot positioning controller which adjusts position of dot included in predetermined range which contacts character line drawing area, in halftone screened image data

Basic Abstract Text (1):
NOVELTY - The image processor includes a dot positioning controller (204) which adjusts the position of the dot included in a predetermined range which contacts the character line drawing area, in the halftone screened image data. A halftone screening unit (203) performs the half tone screening of the image data using the hexagon cell produced by removing the isosceles triangle section from a square cell.

☐ 25. Document ID: JP 2001126059 A

L1: Entry 25 of 26 File: DWPI May 11, 2001

DERWENT-ACC-NO: 2001-402830
DERWENT-WEEK: 200143

TITLE: Method of half-tone screening for image output device, involves forming rectangular half-tone dither tile comprising partial tetragonal lattice hexagonal cells of differing resolution and same aspect ratios

Basic Abstract Text (1):
NOVELTY - The method involves forming rectangular half-tone dither tile (1) with aspect ratios and different resolutions in main and subscanning directions of image output device. The half-tone dither tile comprises partial hexagonal cells (2) on the tetragonal lattice.

Basic Abstract Text (2):
DETAILED DESCRIPTION - Deformation of hexagonal cell is based on aspect ratio of half-tone dither tile. Resolutions in the main and subscanning directions are different for half-tone screening.

Basic Abstract Text (5):
DESCRIPTION OF DRAWING(S) - The figure shows the explanatory diagram depicting arrangement of hexagonal cells on half-tone dither tile.

Standard Title Terms (1):
METHOD HALF TONE SCREEN IMAGE OUTPUT DEVICE FORMING RECTANGLE HALF TONE DITHER TILE COMPRISE TETRAGONAL LATTICE HEXAGON CELL DIFFER RESOLUTION ASPECT RATIO

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

☐ 26. Document ID: EP 293214 A AU 8816615 A BR 8802602 A CA 1306557 C CN 1024964 C CN 1031614 A JP 01085474 A

L1: Entry 26 of 26 File: DWPI Nov 30, 1988

DERWENT-ACC-NO: 1988-339761
DERWENT-WEEK: 198848

TITLE: Producing dithered images on asymmetric grids - selects dithered values in response to continuous tone image values and uses rectangular dither matrix generator based on hexagonal grid

Standard Title Terms (1):
PRODUCE DITHER IMAGE ASYMMETRIC GRID SELECT DITHER VALUE RESPOND CONTINUOUS TONE IMAGE VALUE RECTANGLE DITHER MATRIX GENERATOR BASED HEXAGON GRID

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw Desc | Image

Term	Documents
CELL	900144
CELLS	613079
ARRAY	556617
ARRAYS	153507
HALFTON$5	0
HALFTON	12
HALFTONAL	2
HALFTONE	15005
HALFTONED	870
HALFTONEED	1
HALFTONEFORM	1
((HALFTON$5 OR DITHER$5) WITH HEXAGON$3 WITH (CELL OR MATRI$3 OR ARRAY)).USPT,PGPB,JPAB,EPAB,DWPI,TDBD.	26

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